What I claim is:

1.   A mathematical training system having an electronic abacus device comprising,

an abacus having plurality of counter beads slidably mounted on guide bars and operative

slidably with up and down movements on said guide bars for carrying out mathematical

5   calculations,

motion sensor located below said abacus and operative for detecting movements of said

counter beads and generating a series of electrical signals representing sequence of said up and

down movements,

electrical control and conversion circuit means connected to said motion sensor and

10   operative by said electrical signals and in combination with a microprocessor for converting said

electrical signals to digital data signals.

2.   A mathematical training system having an electronic abacus device comprising,

an abacus having a plurality of counter beads slidably mounted on guide bars and operative

for carrying out mathematical calculations,

15   a plurality of motion sensors mounted on a components board located below said abacus,

baffle members mounted on said counter beads and extending downwards therefrom to said

sensors, and operative to interact with said sensor to generate a series of electrical signals

representing up and down sliding motions sequences of said counter beads along said guide bars,

electrical control and conversion circuit means adapted at said components board and

20   operative in association with a microprocessor for converting said electrical signals to digital data

signals.

3.   A mathematical training system according to Claim 2 including a computing device having

a display monitor adapted to receive and process said digital data signals for displaying a pictorial representation on said display monitor of said abacus and movements of said counter beads during operation of said abacus for mathematical calculation.

4.   A mathematical training system according to Claim 3 wherein said sensors include a light emitting portion and a light receiving portion situated opposite to one another with an air gap located therebetween, and said baffle members are baffle panels mounted on said counter beads and extending from each counter bead to said air gap of an associated sensor located directly below said each counter bead.

5.   A mathematical training system according to Claim 4 wherein said baffle panels is normally located in said air gap of each sensor for blocking the light from said emitting portion of said sensor from impinging on said light receiving portion, and said baffle panels sequentially blocking and unblocking said light when said counter beads are operated slidably up and down said guide bars during the mathematical calculation whereby said electrical signals are generated by said sensors.

6.   A mathematical training system according to Claim 5 including an output port located on said components board and adapted for electrical connection with said computing device for transferring said digital data signals to said computing device for displaying a pictorial representation of the operation of the abacus in a monitor display.

7.   A mathematical training system according to Claim 6 including recording means adapted for recording said digital data signals whereby the operation of the abacus by a student for solving an mathematical assignment is retrievable by an instructor to review the operation of the abacus step by step by the student for solving the mathematical assignment.

-9-

8.   A mathematical training system according to Claim 6 wherein said monitor display shows pictorial representation of both the operation of the instructor's abacus and the operation the student's abacus.

5

10

15

20